


To: Regional Managers/Regional Engineers  
From:  Robert Ball, Deputy Director of Design and Construction  
CC: Ofelia Alcantara, Director of Engineering; Bruce Armistead, Director of Operations and Maintenance; RDP Task Leads  
Date: May 13, 2016  
Subject: Notice to Designers No. 10R1 - Special Track Work: Crossover and Turnouts;  
Tunnel Cross Section Reduction

**Purpose:**

This memorandum establishes the revised guidelines for the Regional Teams to follow in the Preliminary Engineering Design with respect to universal crossover spacing, speed of crossovers and turnouts, and Tunnel Cross Section Reduction.

**Background:**

These guidelines are the result of the cost reduction strategy performed by the Project in 2014 and approved by the Authority.

This Notice to Designer rectifies and supplements the following Technical Memorandums, accordingly:

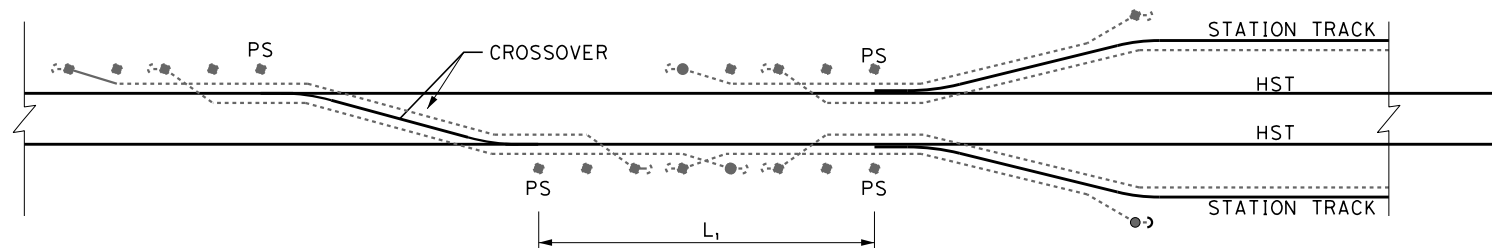
- TM 2.1.3 Turnouts and Station Tracks, Rev. 0.
- TM 2.1.8 Turnouts and Yard Tracks, Rev. 0.
- TM 2.4.2 Basic Tunnel Configuration, Rev. 1.

**Guidelines:**

1. Crossover spacing:
  - a. Increase nominal spacing of the interlockings from 20 miles to 40 miles throughout the program.
  - b. Change universal interlocking from 110 mph to 80 mph.
2. Lower Speed Station Turnouts:
  - a. Reduce size of Turnouts from 110 mph to 60 mph.
  - b. Reducing the speed of the station turnouts is in conjunction with the recommendation to reduce the speed of the universal crossovers and increase their spacing.
  - c. The station platform track between entry turnout and the exit turnout along the main track shall have a 3,350 foot minimum length centered symmetrically on the midpoint of the station platform.
3. Spacing Between Facing Adjacent Points of Switch on Main Tracks
  - a. The distance between two facing points of switch of adjacent crossovers and the distance between the point of switch of a turnout facing an adjacent point of switch of a crossover shall adhere to the following spacing requirements:
    - Desirable distance between two high-speed (60 mph or faster) points of switch: 1400'
    - Minimum distance between two high-speed (60 mph or faster) points of switch: 1000'
    - Desirable distance between two low-speed (55 mph or slower) points of switch: 600'
    - Minimum distance between two low-speed (55 mph or slower) points of switch: 400'
    - Desirable distance between high-speed and low-speed points of switch: 1000'
    - Minimum distance between high-speed and low-speed points of switch: 700'

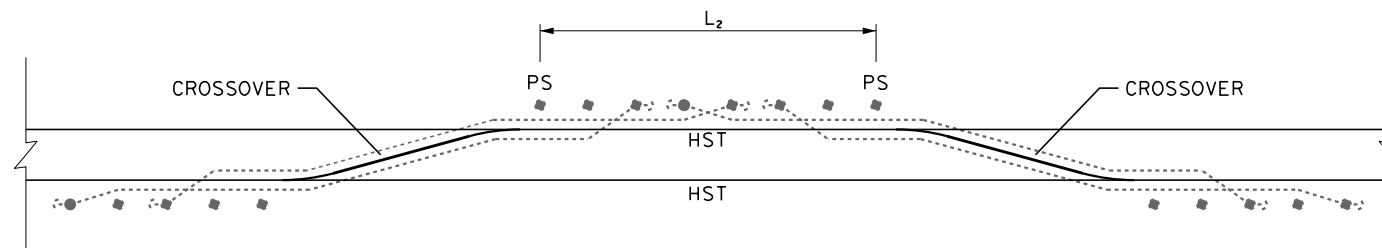
4. Tunnel Cross Section Reduction
  - a. Reduce operating maximum speed in Tunnels from 220 mph to 200 mph.
  - b. Reduce nominal tunnel diameter from 29.5ft ID to 28ft ID.

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### SPACING BETWEEN CROSSOVER AND TURNOUT

PREFERRED:  $L_1 \geq 1400'$   
MINIMUM:  $L_1 \geq 1000'$



### SPACING BETWEEN CROSSOVERS

PREFERRED:  $L_2 \geq 1400'$   
MINIMUM:  $L_2 \geq 1000'$

#### NOTES:

1. THESE REQUIRED SPACING ARE RESERVED FOR TERMINATING THE OCS WIRES AND THE DOWN-GUY INSTALLATION.
2. THESE GUIDELINES APPLY TO HIGH-SPEED (60 MPH AND FASTER) MAINLINE CROSSOVERS AND TURNOUTS WHEN INSULATED OVERLAP WIRING IS USED FOR SECTIONALIZATION.
3. FOR LOW-SPEED (55 MPH AND SLOWER) CROSSOVERS AND TURNOUTS ON THE MAINLINE TRACK, SECTION INSULATOR CAN BE USED FOR SECTIONALIZATION. THE PREFERRED L1 AND L2 SHALL BE 600 FT, AND MINIMUM L1 AND L2 SHALL BE 400 FT. THESE GUIDELINES ARE NOT APPLICABLE TO THE YARD TURNOUTS.
4. FOR A LOW-SPEED (55 MPH AND SLOWER) CROSSOVER OR TURNOUT ADJACENT TO A HIGH-SPEED (60 MPH AND FASTER) CROSSOVER OR TURNOUT ON THE MAINLINE TRACK, THE PREFERRED L1 AND L2 SHALL BE 1000 FT, AND MINIMUM L1 AND L2 SHALL BE 700 FT. THESE GUIDELINES ARE NOT APPLICABLE TO THE YARD TURNOUTS.

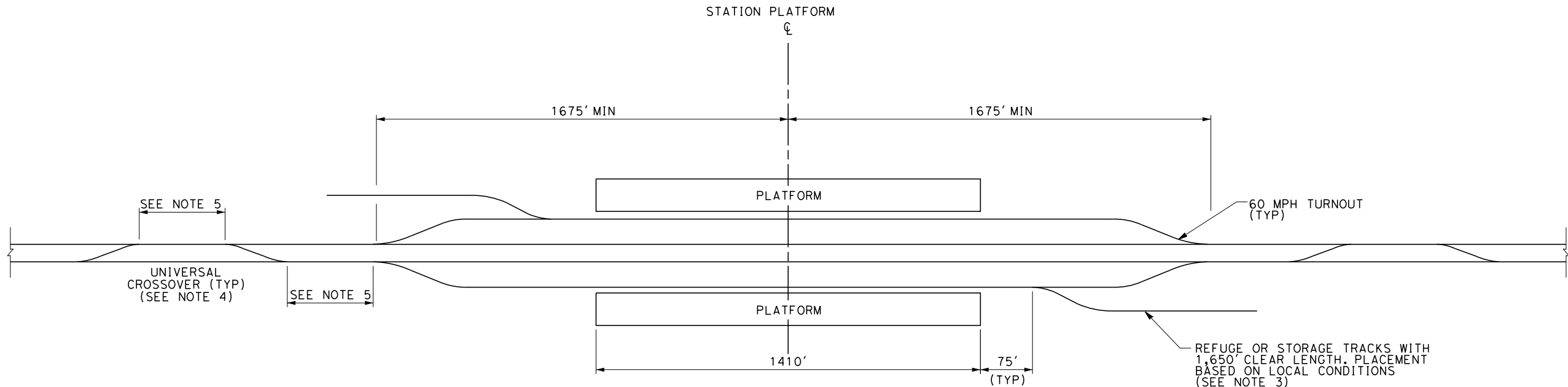
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NOTES:

1. 60 MPH DESIGN OF STATION TRACK, TURNOUTS.
2. GRADE  $\leq$  0.25% MAX.
3. 3300' MINIMUM TOTAL REQUIRED FOR REFUGE OR STORAGE TRACKS. REFUGE OR STORAGE TRACKS CAN BE LOCATED IN ANY QUADRANT OF THE STATION.
4. PROVIDE UNIVERSAL CROSSOVERS BETWEEN MAIN TRACKS AT EACH SIDE OF STATION TRACKS.
5. FOR POINT OF SWITCH SPACING, SEE NTD 10 "SPACING BETWEEN CROSSOVERS AND TURNOUT" DRAWING.



TYPICAL TRACK LAYOUT

INTERMEDIATE STATION WITH HIGH-SPEED TURNOUTS

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